Received: 22 July 2022 | Revised: 15 December 2022 | Accepted: 6 February 2023

DOI: 10.1111/csp2.12912

Conservation Science and Practice
A journal of the Society for Conservation Biology
Open Access
WILEY

PERSPECTIVE

Protected area downgrading, downsizing, and degazettement in Cambodia: Enabling conditions and opportunities for intervention

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Abstract

Protected area (PA) sustainability is challenged worldwide by legal downgrading, downsizing, and degazettement (PADDD). National and local case studies of ecologically destructive PADDD events provide useful insights that may help respond to or prevent future events. Using information from legal documents and expert input, we identified 37 PADDD events that affected two adjacent PAs in northeastern Cambodia differently despite similar economic, environmental, and social conditions. Important differences in local context led to the eventual degazettement (100% loss) of one PA and downsizing (10.49% loss) of the other, the rest of which remains protected. This case study confirms the contribution of secure Indigenous land tenure to durable conservation governance and demonstrates the importance of investing in site-level capacity to ensure that social and ecological conditions are monitored and proposed PADDD events can be successfully challenged.

KEYWORDS

economic land concessions, indigenous land titling, Keo Seima Wildlife Sanctuary, Order 01, PADDD, Snuol Wildlife Sanctuary, social land concessions

1 | INTRODUCTION

Protected areas (PAs) are cornerstones of biodiversity conservation efforts (Watson et al., 2014). PAs must be durable—invulnerable to fluctuating economic demands and political agendas—to effectively contribute long-term to conservation and improved human well-being. Tracking and evaluating PA weakening, reduction, and loss via legal mechanisms reveals a widespread, pervasive phenomenon (Golden Kroner et al., 2019; Mascia et al., 2014; Mascia & Pailler, 2011). The PA downgrading, downsizing, and degazettement (PADDD) framework defines

downgrading as decreases in legal restrictions on human uses within a PA; *downsizing* as reductions in PA size via a legal boundary change; and *degazettement* as complete loss of legal protection (Mascia & Pailler, 2011). Since 1892, more than 4200 PADDD events in 74 countries have affected over 3.4 million km^2 of protected land and ocean, >500,000 km^2 of which represent a complete loss of legal protections (CI & WWF, 2021; Golden Kroner et al., 2019). Some PADDD events, for example, consolidating and optimizing PA networks (Dorji et al., 2020) or securing Indigenous land rights (Borges et al., 2019), likely do not adversely affect biodiversity (e.g., Naughton-Treves & Holland, 2019). Nevertheless, the majority (61%) of global PADDD events were enacted to enable or expand industrial-scale economic activities, especially agriculture, infrastructure, and resource extraction (Golden Kroner et al., 2019).

Southeast Asia (SEA) has exceptional faunal diversity and more threatened species than any other terrestrial area (Gray et al., 2018). Its deforestation rate, among the highest globally, is accelerating (Hughes, 2017; Kim et al., 2015), driven predominantly by industrial-scale agriculture, infrastructure development, and mining (Estoque et al., 2019). In 1910–2013, at least 255 PADDD events occurred in SEA (CI & WWF, 2021). Proximate causes include industrial agriculture, infrastructure, and rural settlements, yet impacts on conservation outcomes are poorly understood (Golden Kroner et al., 2019).

PADDD may accelerate forest loss (e.g., in Malaysia and Peru, Forrest et al., 2015), or forest loss may increase PADDD risk (e.g., in Brazil, Tesfaw et al., 2018). These dynamics hamper predictions of PADDD's impacts on biodiversity loss, hindering risk assessments and the design of proactive responses to prevent or mitigate potentially damaging PADDD events. Case studies evaluating national and local conditions that enable destructive PADDD events offer valuable lessons (Golden Kroner et al., 2019; Qin et al., 2019). Insights into economic, environmental, political, and social contexts that shape PADDD can support hypothesis generation, inform research on PADDD impacts, and support NGOs, businesses, governments, and the public to create conditions and influence decisions that reduce negative PADDD events. Transparent reporting of opposition to events may help anticipate and prevent PADDD.

This paper compares the economic, political, and social contexts and PADDD mechanisms affecting two PAs to generate insights that can apply to other regions. We collected and reviewed legal documents (see Data S1 for detailed methodology) for 37 PADDD events enacted over a decade (2009–2018) in two adjacent PAs in northeastern Cambodia. Based on our experience (MN, HW, VU, OG, KH, AD) at the site, we describe the events' national and local economic and political contexts and the different conditions affecting each PA, which resulted in partially successful responses to PADDD events at one site, and significant biodiversity loss at the other. We highlight examples of PADDD events from these PAs with both positive and negative impacts on biodiversity, and legal procedures that lack transparency and due process. Finally, we discuss the relevance of these lessons for the global conservation community.

2 | CASE STUDY

2.1 | Site

The Eastern Plains Landscape is one of SEA's largest contiguous PA networks, with six PAs covering over 1 million hectares (O'Kelly et al., 2012). Keo Seima Wildlife Sanctuary (hereafter "Keo Seima"), located in Mondulkiri and Kratie provinces, became a PA in 2002 and remains protected (Figure 1). Snuol Wildlife Sanctuary (hereafter "Snuol") in Kratie province became a PA in 1993, but after 24 downgrading and downsizing events was degazetted in 2018 (Figure 1). Both PAs were originally designated because surveys identified important biodiversity (Baltzer et al., 2001; Walston et al., 2001). Subsequent monitoring in Keo Seima in 2010–2020 emphasized its global importance for several threatened species, including the endangered Southern yellow-cheeked crested gibbon (*Nomascus gabriellae*, Evans et al., 2013; Nuttall et al., 2017, 2022). Keo Seima has had relatively well-funded management compared with other Cambodian PAs, largely due to close collaboration between an international conservation NGO (the Wildlife Conservation Society, WCS) and the Royal Government of Cambodia (RGC). WCS did not work in Snuol because it was managed by the Ministry of Environment, with whom WCS did not have a formal relationship. Keo Seima was managed by the Forestry Administration with whom WCS had an existing relationship, and the site's history as a logging concession presented an opportunity for an innovative model of conservation. WCS leverages external funding, provides technical capabilities, and over the last 15 years has supported development of a REDD+ project at Keo Seima that constitutes nearly 60% of the PA (1670 km^2). Snuol received little funding and investment in personnel from RGC and no organizations worked there. Thus, Snuol never had an active conservation program and law enforcement activities were less substantial than in NGO-supported PAs in the Eastern Plains Landscape.

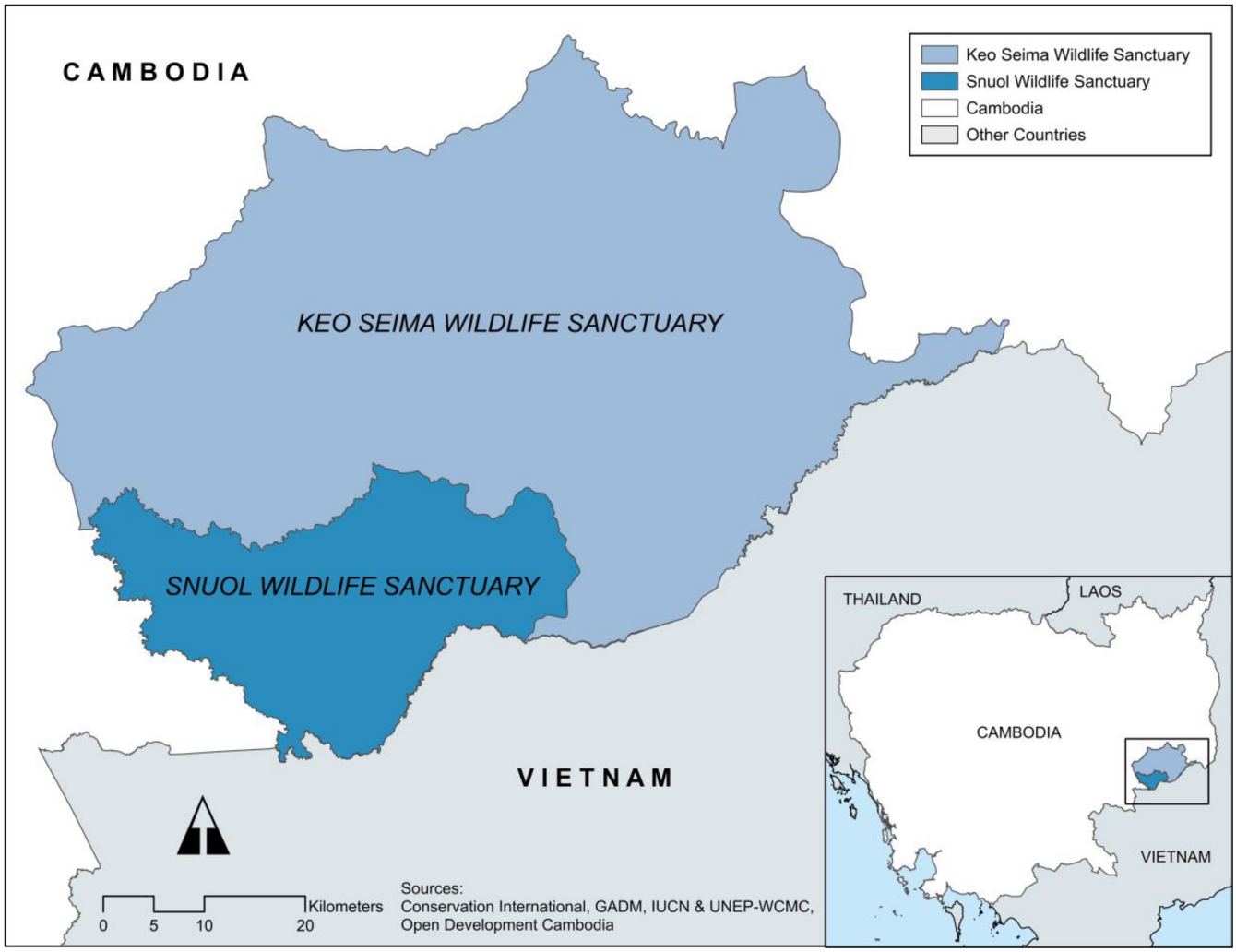

FIGURE 1 Boundaries of Keo Seima Wildlife Sanctuary and Snuol Wildlife Sanctuary in northeastern Cambodia, prior to protected area downgrading, downsizing, and degazettement (PADDD) events discussed in this paper (Data available from https://data.opendevelopmentcambodia.net/dataset/protectedareas).

2.2 | Enabling PADDD: National conditions

After democratic elections in 1993, Cambodia experienced rapid economic growth (Hughes & Un, 2011). This followed decades of war and civil unrest that left Cambodia with no official public records of land ownership, resulting in conflict and insecure land tenure. National policies emerged that paved the way for PADDD events to occur in both PAs. From the mid-2000 s, the government awarded agro-industrial land concessions to encourage economic growth (Neef et al., 2013). Concessions initially contributed to the economy through exporting timber cleared from forests, feeding regional and global timber demand (Li et al., 2008; Sun, 2014), then through agricultural production and export (Borras Jr. & Franco, 2011; Fox & Castella, 2013). These industrial-scale economic land concessions (hereafter "economic concessions") were criticized for deforestation impacts (Davis et al., 2015), legal opacity, and apparent disregard for local land rights and PAs (Beauchamp et al., 2018; Global Witness, 2013; Magliocca et al., 2019; Neef et al., 2013; Vrieze & Kuch, 2012). Most were granted to foreign companies (LICADHO, 2021). By 2013, 1.2 million hectares had been leased for economic concessions, including 346,000 ha within PAs (CI & WWF, 2021; Global Witness, 2013; Watson et al., 2014). Following international development partners' requests, RGC introduced social land concessions (hereafter "social concessions") to increase land distribution and secure households' land tenure (Oldenburg & Neef, 2014).

The 2001 Land Law secures the land rights of Indigenous peoples. By 2012, three communities had received an Indigenous Communal Land Title (hereafter "Indigenous title"), and many others were preparing applications (Milne, 2013). Indigenous titles provide legal tenure over

Indigenous communities' traditional lands, emphasizing communal ownership and management and allowing traditional rotational agriculture (Milne, 2013). In addition to economic concessions, social concessions, and Indigenous titles, a further land acquisition scheme—Order 01—was launched in 2012. Order 01 aimed to rapidly distribute individual land titles, predominantly to rural families living around economic concessions to prevent or resolve the conflict between concessionaires and residents. Over 600,000 individual titles were issued in 2 years, securing families' land tenure (Grimsditch & Schoenberger, 2015). However, the scheme faced criticisms of inaccurate land measurements, procedural inconsistencies, lack of transparency, failure to address conflicts, and issuance of titles within PAs (Grimsditch & Schoenberger, 2015; Milne, 2013).

These four land tenure mechanisms (economic concessions, social concessions, Indigenous titles, Order 01) led to widespread changes in land use and ownership nationwide (Grimsditch & Schoenberger, 2015; Neef et al., 2013). They were operationalized simultaneously, with poor administration and a lack of transparent legal procedures, leading to many negative consequences for PAs, especially forest loss resulting from rapid private and commercial land titling within PA boundaries. A traditionally top-down approach to policy implementation (despite decentralization efforts, see Faguet, 2014) limited sub-national governments' autonomy to effectively apply these mechanisms locally. Finally, each mechanism requires input from multiple government ministries. Coupled with a historical division of responsibility for environmental management between the Ministry of Environment and Ministry of Agriculture, Forests and Fisheries, PA conflicts led to complex jurisdictional stalemates.

2.3 | Enabling PADDD: Local conditions

Rapid increases in economic and social concessions and Order 01's nationwide implementation drove dramatic changes to infrastructure and land use locally, particularly in rural areas such as the Eastern Plains Landscape. Legal restrictions forbid economic and social concessions inside PAs that are categorized as state public land, but "ecologically degraded" areas are exempt (RGC, 2001). RGC frequently applied such exceptions to facilitate granting concessions inside PAs, despite little transparent evidence to support degradation claims. Economic concessions require large workforces and infrastructure, and both social concessions and Order 01 granted farmland to newly arrived landless families. Improved transport infrastructure, often developed by economic concession companies, increased the accessibility of the previously remote Eastern Plains Landscape. In combination, these factors led to large-scale immigration, increasing population density, urbanization, and land speculation, all of which had negative consequences for PA ecological values (Davis et al., 2015; Evans et al., 2013; Symes et al., 2016).

Economic concessions were established within both Keo Seima and Snuol. Forest inside economic concession boundaries in both PAs was cleared rapidly, followed by forests bordering concessions (Figure 2). In Keo Seima, the PA authority's law enforcement capacity was overwhelmed by the volume of people—both economic concession employees and opportunistic migrants—and the speed of illegal forest clearance, resulting in significant forest loss. Regular conflicts between the PA authority and economic concessionaires regarding concession boundaries exacerbated the situation. In Snuol, once forest within economic concession boundaries had been cleared, social concessions were awarded on the same lands, allowing immigrants to settle. Rapid clearance of forest adjacent to economic concessions led to much of the PA being designated as "degraded," thus facilitating the allocation of further social concessions. Insufficient law enforcement capacity in both Keo Seima and Snuol allowed land speculation and illegal forest clearance to also occur in parts of the PAs not adjacent to economic concessions. Order 01 was then used to claim individual titles to cleared land, despite the plots being inside PA boundaries. Implementation of Order 01 in both PAs lacked transparency, regulation, and communication between titling officials and PA authorities. This allowed many land title applications within the PAs to succeed, thus inappropriately legalizing these claims.

2.4 | Resulting PADDD events in Keo Seima and Snuol

In Keo Seima, 307.14 km^2 (10.49%) of the PA has been downgraded or downsized (Table 1), resulting in complete forest loss across most affected areas (Figure 2). The REDD+ project area was not affected. Most of Snuol's forest was clear-felled by 2014 (Figure 2). Despite their adjacent locations and similar political and local contexts, the number and extent of PADDD events in Keo Seima and Snuol differ considerably (Table 1; Figure 3). Keo Seima lost 0.77% of its total area and remains important for biodiversity (Nuttall et al., 2022), while Snuol lost ~87.6% in 2009–2013, before being entirely degazetted in 2018. Six PADDD events in Keo Seima and two in Snuol represent granting of Indigenous titles, which can benefit both Indigenous land rights and conservation outcomes

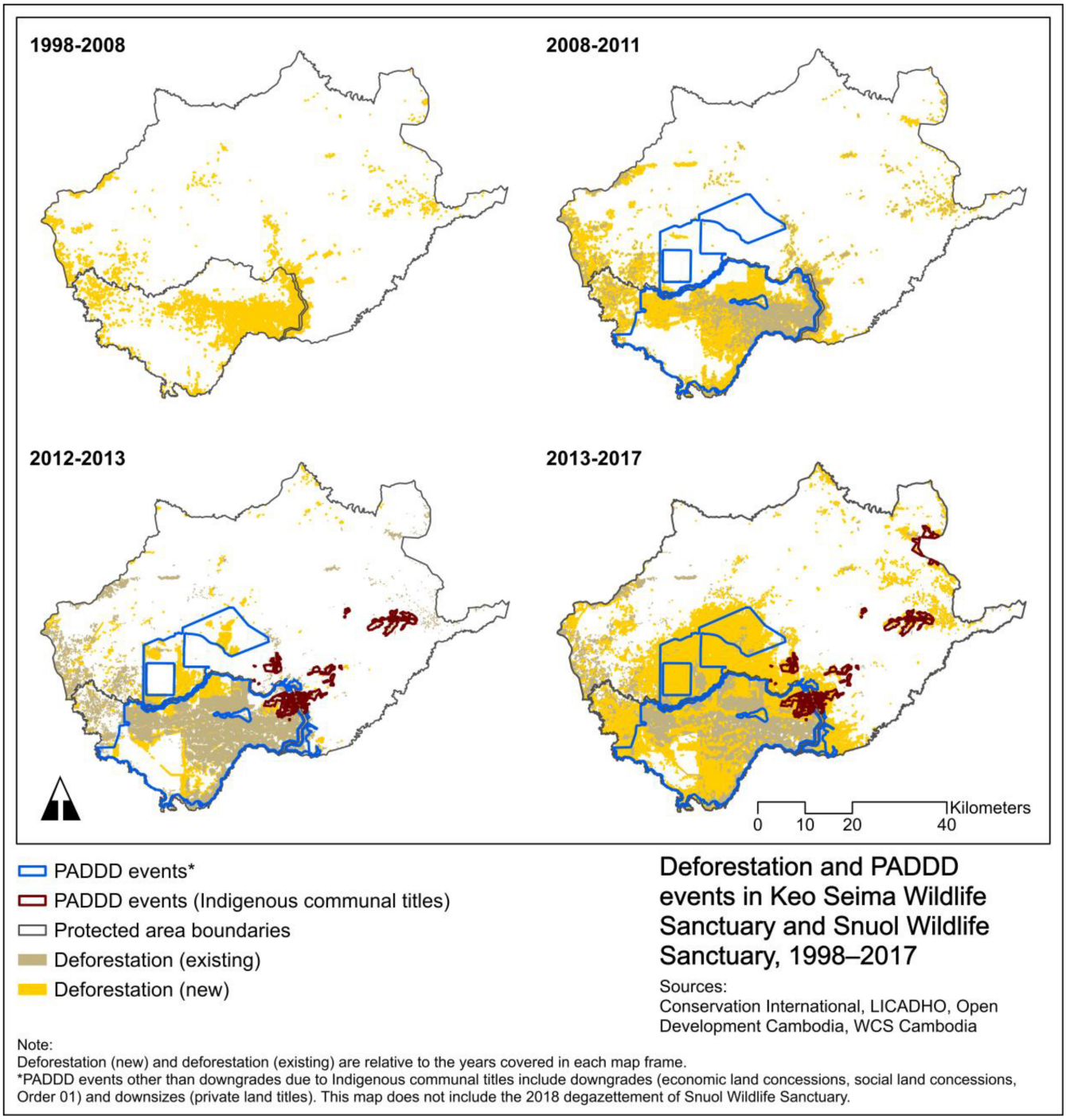

FIGURE 2 Deforestation and protected area downgrading, downsizing, and degazettement (PADDD) events in Keo Seima Wildlife Sanctuary and Snuol Wildlife Sanctuary, 1998–2017.

(Schreckenberg et al., 2016). Secure land tenure for Indigenous communities allowed clear demarcation between community and PA land, provided legal agricultural land, and strengthened the communities' ability to prevent immigration, illegal clearing by outsiders, and allocation of concessions. The area of Keo Seima bordering Snuol experienced illegal deforestation and titles were awarded through Order 01. Many of Snuol's PADDD events were enacted as a result of forest clearance. Social concessions were awarded on previously cleared economic concessions and illegally cleared land became classified as "degraded" and was thereby also eligible to be awarded as social concessions or titled through Order 01.

TABLE 1 Protected area downgrading, downsizing, and degazettement (PADDD) events occurring in two adjacent protected areas in northeastern Cambodia.

Protected area	Year gazetted	Original PA extent (km^2)	PA extent in 2018 (km^2)	Number of PADDD events				Years of PADDD event occurrence	Area affected (%)
				Downgrade[a]	Downsize[b]	Degazette	Total		
Keo Seima Wildlife Sanctuary[c]	2002	2926.9	2904.23	10	2	0	12	2011–2015	10.49
Snuol Wildlife Sanctuary	1993	750	0	16	8	1	25	2009–2018	100

[a]Economic concessions, social concessions, and Indigenous titles.
[b]Private titles granted following Order 01.
[c]In 2002, this PA was originally gazetted as Seima Biodiversity Conservation Area under the management of the Ministry of Agriculture, Forestry and Fisheries. In 2009, it was redesignated as Seima Protection Forest, which it remained until 2016. All PADDD events within the PA boundary occurred during this time. In 2016, it was redesignated again as Keo Seima Wildlife Sanctuary, with management transferred to the Ministry of Environment.

2.5 | Responses to PADDD events

WCS has worked with RGC since 1999, providing financial, technical, and management support nationally and across multiple landscapes, including in Keo Seima but not in Snuol. Keo Seima's governance and management is a hybrid of the "project co-management" and "financial-technical support" models of PA management (see Baghai et al., 2018), with close working relationships between government and NGO staff. This long-term collaboration—NGO and government staff worked in close-knit teams sharing office space—promoted rapid formal and informal information sharing about PADDD events under consideration by RGC.

The NGO–government collaboration provided Keo Seima with well-resourced technical teams who reacted quickly to proposed PADDD events. Geographic Information Systems (GIS) staff could access government-approved spatial data (e.g., delineated PA boundaries) and up-to-date habitat and land-cover data, allowing accurate spatial interrogation of proposed events (e.g., concessions, Order 01 land parcels). Biodiversity monitoring staff had collected and analyzed data, produced a species list, and had reliable population estimates and areas of occurrence for several key species, highlighting the site's regional and global importance. Community engagement staff had detailed demographic and socioeconomic data on communities within Keo Seima, demonstrating the forest's importance for livelihoods and Indigenous culture, and had supported strengthening local land rights through Indigenous titling. Intelligence on forest clearance associated with illicit Order 01 claims was often initially received from Indigenous communities. Law enforcement staff had evidence (e.g., patrol records) of attempts to prevent illegal clearance of many of the proposed Order 01 land parcels within Keo Seima. The technical teams submitted this evidence to RGC in persuasive reports highlighting the importance of Keo Seima for environmental protection and land rights, and the weaknesses of proposals for concessions or titles, based on defined legal processes for awarding each (e.g., consideration of environmental impact assessments, Indigenous land rights, forest area intactness). This coherent strategy reduced the number of Order 01 land titles that were finally awarded.

In contrast, Snuol did not benefit from collaborations with an NGO or other partners and had none of the ecological or social data, resources, and technical teams, precluding effective interventions against proposed PADDD events (Table 2). Snuol was degazetted in 2018; very little forest cover remains within the former PA.

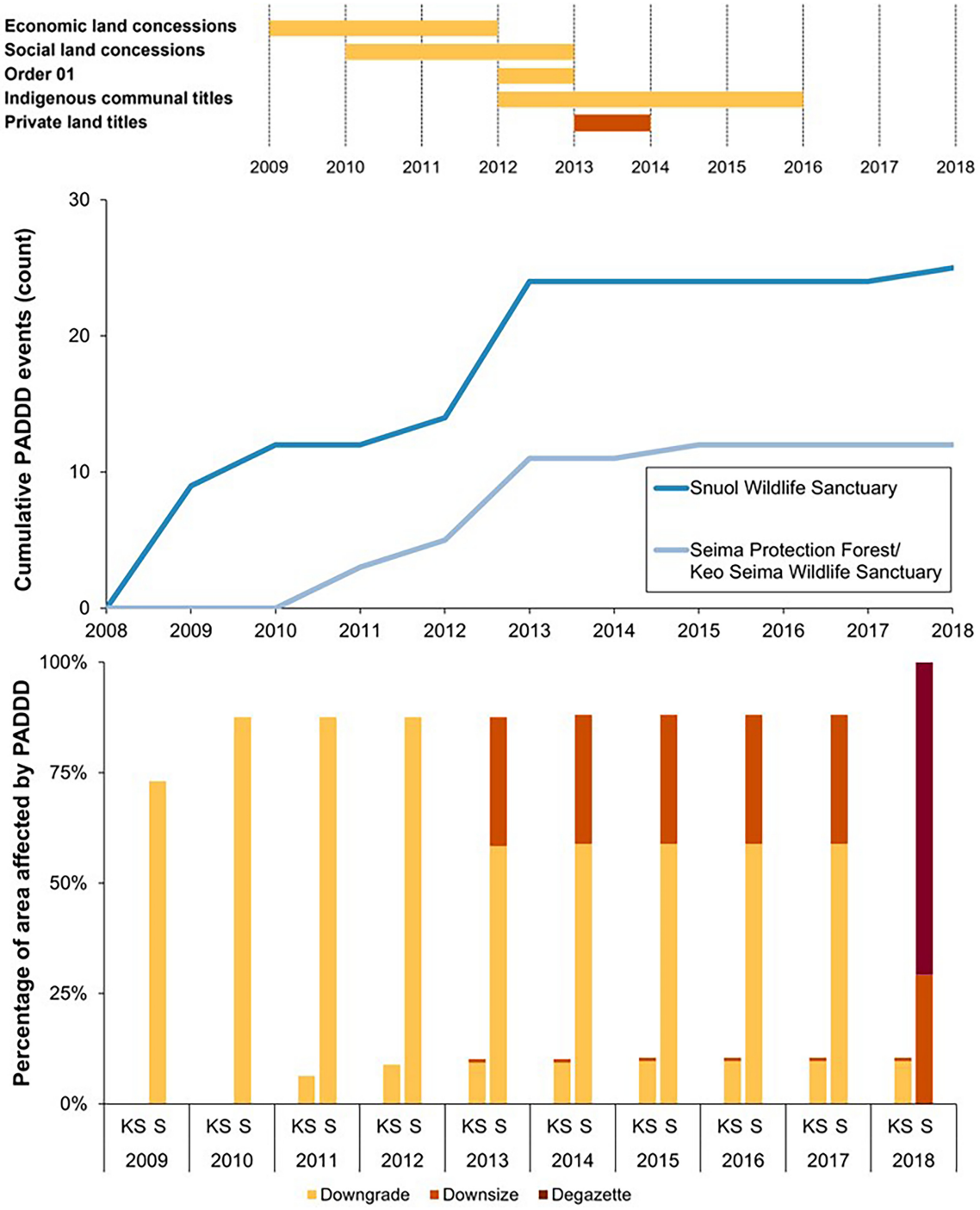

FIGURE 3 Summary of protected area downgrading, downsizing, and degazettement (PADDD) events in Keo Seima Wildlife Sanctuary and Snuol Wildlife Sanctuary between 2009 and 2018. Top—timeline of PADDD events, separated by event type. Middle—cumulative count of PADDD events in both protected areas. Bottom—percentage of area affected by PADDD in both protected areas, separated by event type.

3 | DISCUSSION

Understanding the conditions in which PADDD events occur is critical to anticipating and challenging events that are likely to negatively affect biodiversity (Golden Kroner et al., 2019; Naughton-Treves & Holland, 2019). Our case study demonstrates how PADDD events shaped by the same national-level economic and political conditions affected two adjacent PAs in very different ways. Overall, the events resulted in deforestation and can be assumed to have had negative consequences for biodiversity in both PAs (Figure 2; Walston et al., 2001). However, one PA was extensively impacted and subsequently degazetted, while the other continues to protect

TABLE 2 Framework for assessment and comparison of factors affecting protected area downgrading, downsizing, and degazettement (PADDD) in Keo Seima Wildlife Sanctuary and Snuol Wildlife Sanctuary in Cambodia.

Management dimension	Factors identified in this case study	Indicators identified in this study	Status	
			Keo Seima Wildlife Sanctuary	Snuol Wildlife Sanctuary
Design and planning	Management planning and design	Short-term project planning; long-term management planning; horizon scanning exercises; theories of change to guide conservation interventions	✓	×
	Process for securing Indigenous land tenure	Legal, transparent process for local communities to gain secure tenure of ancestral lands	✓	✓
Capacity and resources	Sustainable financing	Source of sustainable financing (e.g., REDD+) that can provide sufficient funds for protected area management activities over the long term	✓	×
	Law enforcement capacity (including technical and financial support)	Proactive and reactive law enforcement teams; regular patrols; sufficient equipment; regular communication and collaboration with monitoring and community teams	✓	×
	Ability to react quickly to proposed PADDD	Sufficient human and financial resources; positive working relationships between PA staff and local, provincial, and national government	✓	×
Monitoring and enforcement systems	Forest cover monitoring	Regular, accurate, high-resolution forest cover monitoring via remote sensing	✓	×
	Biodiversity monitoring	Comprehensive species lists; data on species distributions, relative abundance over space, or presence/occupancy; data on species population trends over time; threats monitoring (e.g., snares)	✓	×
Decision-making arrangements	Open, transparent legal process governing PADDD	Legal processes for downgrading, downsizing, and degazettement of protected areas are clearly outlined in existing legislation; legal clauses exist and are followed for public and expert consultation of proposed events; legal clauses exist and are followed for environmental impact assessments of proposed events; transparent and robust process for recording opposition, lodging appeals or complaints against proposed events	×	×

TABLE 2 (Continued)

Management dimension	Factors identified in this case study	Indicators identified in this study	Status: Keo Seima Wildlife Sanctuary	Status: Snuol Wildlife Sanctuary
	Protected area management support and technical advice	Technical support for administration and daily operations; expert advice	✓	×
	Support and engagement by PA management to local communities	Positive, long-term working relationships between PA management and local communities; support for community activities; promotion of Indigenous land rights; community engagement with PA management planning	✓	×

Source: Management dimensions are taken from Geldmann et al (2018).

biodiversity and support more equitable inclusion of Indigenous communities. The presence of a REDD+ project in Keo Seima, providing both stable funding for protected area management and financial incentives to RGC and local communities through the sale of carbon credits, likely has had some effect on protecting Keo Seima from the deforestation and degradation that was used to justify granting economic concessions in Snuol. Despite continued deforestation in Keo Seima since 2017, which has seen between 500 and 2000 ha of deforestation per year (World Resources Institute, 2014), between 2010 and 2019, an estimated 21,589 hectares of deforestation were avoided in Keo Seima's REDD+ project area (WCS, 2020). Through its flagship status and advocacy, the REDD+ project has had a direct influence on decision-makers, by increasing consideration of the site's forest, biodiversity, and community values.

Ineffective governance of PAs is common wherever top-down decision-making, lack of procedural obligations, local power dynamics, and poor transparency hinder successful opposition to proposed PADDD events (Dawson et al., 2018; de Koning et al., 2017; Morea, 2019; Paudel et al., 2013). PA staff in our case study struggled to manage and prevent PADDD events because legal processes, including proposed boundary and regulatory changes, often lacked transparency with few opportunities for participation by NGOs or PA managers. Although generalizing PADDD drivers is difficult (Qin et al., 2019), many of the legal and institutional challenges that precluded effective and transparent opposition to these PADDD events are not unique to Cambodia. Weak, opaque, and poorly understood legal frameworks and processes also exist in other countries and often allow misinterpretation or abuse through loopholes or gaps in environmental law (Boillat et al., 2018; Xu et al., 2019).

Our case study provides important insights into policies and conditions that were precursors to multiple PADDD events, and the tools available to oppose these events (Table 2). It provides further evidence of the important role that Indigenous land tenure can play in increasing equity and securing land in and around PAs against economic land speculation (Schreckenberg et al., 2016). Future research compiling additional PADDD case studies focused on one site (e.g., Golden Kroner et al., 2016), in a comparative framework (as in this analysis, Table 2) or using other approaches would reveal further insights to the contextual factors shaping PADDD events and how PADDD may be avoided.

This analysis demonstrates that national policies for rapid, widespread land titling can have substantial negative consequences for PAs, especially in the context of top-down governance and weak legal institutions. Such policies require robust tracking by independent actors (e.g., NGOs, academics) to allow quick reactions to threats to PA integrity, and to improve transparency and accountability. Where appropriate, collaboration with central governments to reform policies that regulate PADDD would be valuable (Qin et al., 2019).

In this case study, WCS and RGC's long-term relationship in Keo Seima gave the management team political capital to leverage central government support and oppose proposed PADDD events. Long-term working relationships—within government and between government and external partners—that foster collaboration, trust, and investment are vital to conservation management. Long-term investments in technical teams

(e.g., monitoring and research, law enforcement, and community engagement) are critical for PA functioning (Geldmann et al., 2015). Our case study demonstrates that PA management teams need appropriate capacity and access to current datasets describing social and ecological PA features. Managers lacking sufficient human and information resources will be unable to mount an effective opposition to proposed environmentally damaging PADDD events, struggling to ensure long-term PA integrity under increasing economic and social pressures. Conservation success therefore requires continued financial, human, and technical capacity both to establish, and effectively and equitably govern, PAs for the long term.

ACKNOWLEDGMENTS

The authors would like to thank former WCS Cambodia staff members Phien Sayon and Jeff Silverman for their efforts in collating relevant laws, sub-decrees, and spatial data, and Dr. Sereyrotha Ken for reviewing the manuscript. M. Nuttall was funded by the UK Natural Environment Research Council (IAPETUS Doctoral Training Partnership). R. Golden Kroner and E. Olsson were supported by the Ann and Tom Friedman Fellows for Science Program.

DATA AVAILABILITY STATEMENT

Data for certain PADDD events related to economic land concessions are currently available to download from PADDDtracker.org. The full data set of PADDD events identified in this paper, which includes updated versions of the events on PADDDtracker.org, is currently maintained by the authors. A downloadable package will be provided for reviewers alongside the paper submission on PADDDtracker.org.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Nuttall, M., Olsson, E., Washington, H., Ung, V., Bunnefeld, N., Merriman, J., Griffin, O., Hobson, K., Diment, A., & Kroner, R. G. (2023). Protected area downgrading, downsizing, and degazettement in Cambodia: Enabling conditions and opportunities for intervention. *Conservation Science and Practice*, *5*(4), e12912. https://doi.org/10.1111/csp2.12912